

# LESSON

## 10

# What are the parts of an atom?

People once thought that the atom was the smallest particle of matter in the universe. However, scientists now know that atoms are made up of even smaller parts. There are three different kinds of particles. They are: **protons** [PRO-tahnz], **neutrons** [NEW-trahnz], and **electrons** [i-LEK-trahnz].

Most of the mass of an atom is found in the central part of the atom, called the **nucleus** [new-KLEE-us]. The nucleus of an atom is made up of protons and neutrons. These particles are packed very tightly together in the nucleus.

Electrons are found outside the nucleus. They circle the nucleus very, very quickly. Electrons are very small and have almost no mass. The number of electrons in an atom is always equal to the number of protons in the nucleus of that atom.

Scientists have discovered that protons, electrons, and neutrons have different **charges**. You probably know that the word "charge" has something to do with electricity.

There are two kinds of charges. There are positive (plus) charges and negative (minus) charges. By studying atoms, scientists have learned that:

- PROTONS have positive (+) charges.
- ELECTRONS have negative (-) charges.
- NEUTRONS have no charges. They are neutral.

Since atoms have the same number of protons and electrons, the number of positive charges equals the number of negative charges. The opposite charges cancel each other out. Therefore, **THE WHOLE ATOM HAS NO OVERALL CHARGE.**

## ATOMIC DIAGRAMS

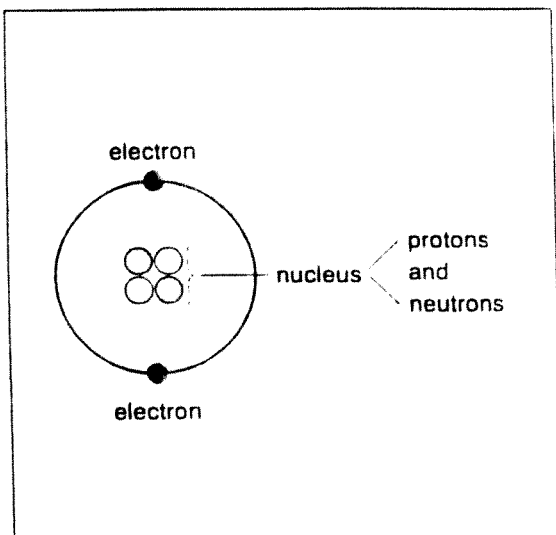


Figure A

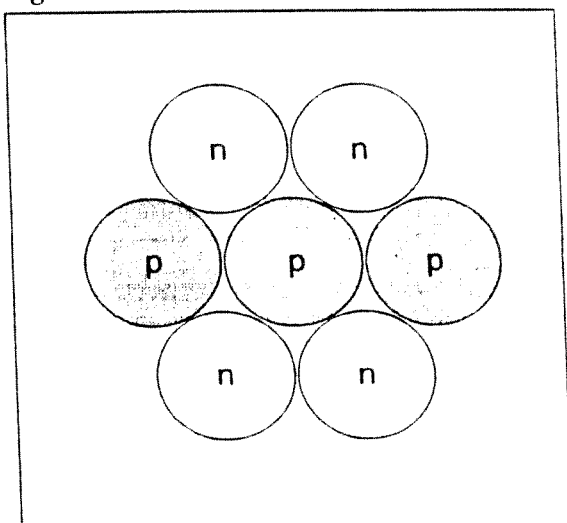


Figure B

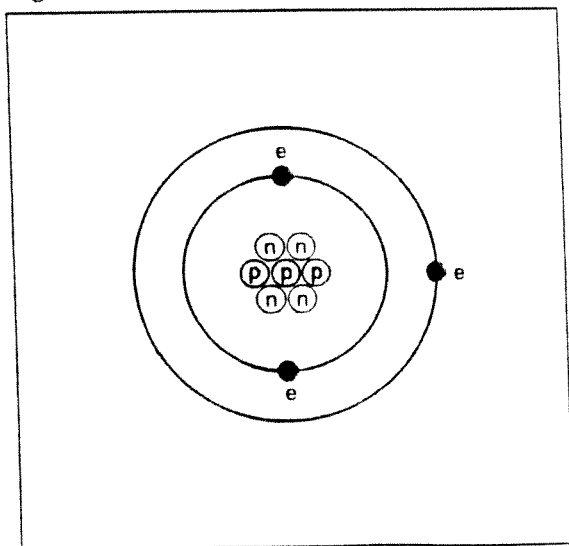


Figure C

The table below tells where the parts of the atom are found and what the charge of each part is.

Name of part	Where it is found	Charge
proton	inside the nucleus	+
neutron	inside the nucleus	0
electron	outside the nucleus	-

Figure B shows the center of a lithium atom. The center of an atom is called its nucleus.

1. Name the parts that make up a nucleus.  
\_\_\_\_\_
2. In the diagram, each "p" stands for \_\_\_\_\_; each "n" stands for a \_\_\_\_\_.
3. How many protons are in a lithium nucleus?  
\_\_\_\_\_
4. How many neutrons are in a lithium nucleus? \_\_\_\_\_

Figure C shows a full lithium atom.

5. Label the nucleus on the diagram.
6. Draw in a small "e" next to each electron.
7. How many electrons does a lithium atom have? \_\_\_\_\_
8. How many positive charges are in the atom?  
\_\_\_\_\_
9. How many negative charges are in the atom?  
\_\_\_\_\_
10. What is the overall charge of the atom? \_\_\_\_\_